

What is claimed is:

- 1 1. A method for uniformly printing pixel rows of a predetermined region of an image swath in a color, comprising:
 - 3 providing a first printhead having a first ink matched to the color and at least one additional printhead having a fluid, each printhead having individual printing elements for controllably printing individual pixels in corresponding ones of the rows;
 - 6 detecting defective printing elements and functional printing elements in the first printhead;
 - 8 identifying the rows corresponding to the defective printing elements and the functional printing elements; and
 - 10 printing individual pixels with at least one of the additional printheads such that a higher percentage of pixels in the rows corresponding to the defective elements are printed relative to the percentage of pixels printed in the rows corresponding to the functional elements.
- 1 2. The method of claim 1, wherein the fluid is a colored ink.
- 1 3. The method of claim 2, wherein each at least one additional printhead has a different colored ink.
- 1 4. The method of claim 2, wherein the first ink is black ink, and the colored ink is selected from the group consisting of cyan ink, magenta ink, and yellow ink.

1 5. The method of claim 1, wherein the fluid is a conditioning solution.

1 6. The method of claim 5, wherein the conditioning solution has a substantially
2 clear color.

1 7. The method of claim 1, further including:

2 printing at least some individual pixels with the first printhead.

1 8. The method of claim 7, wherein some individual pixels are printed with the at
2 least one of the additional printheads before the some individual pixels are printed with the
3 first printhead such that the fluid is placed on the image swath below the first ink.

1 9. The method of claim 8, wherein some individual pixels are printed with a
2 different at least one of the additional printheads after the some individual pixels are
3 printed with the first printhead such that the fluid is placed on the image swath on top of
4 the first ink.

1 10. The method of claim 7, further comprising:

2 providing image data; and

3 processing the image data to form the image swath.

1 11. A method for printing a predetermined region of an image swath organized in
2 rows and columns of pixels in a color, comprising:
3 identifying defective printing elements in a first printhead;

4 providing at least one under/overprinting map defining a predetermined total
5 percentage of under/overprinted pixels, the map enabling the printing of relatively more
6 pixels in at least some rows corresponding to the defective printing elements and relatively
7 fewer pixels in at least some other rows corresponding to other printing elements; and
8 printing the predetermined region with at least one additional printhead according
9 to the corresponding one of the under/overprinting maps.

1 12. The method of claim 11, wherein the predetermined total percentage is the
2 same regardless of the number of defective printing elements in the first printhead.

1 13. The method of claim 11, wherein the predetermined total percentage is
2 proportional to the number of defective printing elements in the first printhead.

1 14. The method of claim 11, wherein the predetermined region represents at least a
2 portion of at least one text character.

1 15. The method of claim 11, further including:
2 printing the predetermined region with the first printhead.

1 16. The method of claim 15, wherein the first printhead deposits drops of an ink
2 having the color, and each additional printhead deposits drops of another fluid.

1 17. The method of claim 16, wherein the ink is a pigment-based ink.

1 18. The method of claim 16, wherein the fluid is a dye-based ink having a different
2 color.

1 19. The method of claim 18, wherein:
2 the color is black;
3 the at least one additional printhead is a second printhead and a third printhead;
4 the second printhead deposits drops of cyan ink; and
5 the third printhead deposits drops of magenta ink.

1 20. The method of claim 11, wherein the predefined total percentage of
2 under/overprinted pixels is different for at least some of the overprinting maps.

1 21. The method of claim 11, wherein the providing further comprises, for each of
2 the at least one under/overprinting maps:
3 constructing the at least one under/overprinting map based on the defective
4 printing elements.

1 22. The method of claim 11, wherein the providing further comprises, for each of
2 the at least one under/overprinting maps:
3 selecting one of a predefined set of under/overprinting maps based on the defective
4 printing elements.

1 23. The method of claim 11, wherein the corresponding under/overprinting map
2 has a width less than or equal to the number of columns in the swath and a height less than

3 or equal to the number of rows in the swath, and wherein the printing further comprises
4 replicating the under/overprinting map in the column direction and the row direction so as
5 to encompass the total number of rows and columns in the swath.

1 24. A swath printer, comprising:

2 means for identifying defective printing elements in a first printhead of the swath
3 printer;
4 means for mapping at least one of the defective printing elements to at least one
5 corresponding defectively-printed pixel row in a uniformly colored region of an image
6 swath; and

7 means for under/overprinting with another printhead more pixel positions in at
8 least one defectively-printed pixel row than in at least some other pixel rows so as to
9 compensate for the defective printing element corresponding to the defectively-printed
10 pixel row.

1 25. A swath printing system, comprising:

2 a print mechanism responsive to control commands for printing drops of a colored
3 ink and at least one additional fluid from a plurality of printing elements onto specific pixel
4 locations of pixel rows of a print medium to print an image;
5 at least one under/overprinting map for governing the printing of the drops of a
6 corresponding at least one additional fluid, the map defining a relatively higher percentage
7 of printable pixel locations in the pixel rows corresponding to defective ones of the

8 printing elements and a relatively lower percentage of printable pixel locations in the pixel
9 rows corresponding to functional ones of the printing elements; and
10 a print controller connected to the under/overprinting map and the print
11 mechanism, the print controller adapted to receive image data for a region of uniform
12 color and generate control commands for printing drops of the at least one additional fluid
13 as governed by the under/overprinting map.

1 26. The swath printing system of claim 25, further comprising:
2 a printing element quality detector connected to the print mechanism and the print
3 controller for identifying the defective ones of the printing elements and the functional
4 ones of the printing elements.

1 27. The swath printing system of claim 25, wherein the print controller further
2 generates control commands for printing drops of the colored ink.